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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/225,189	01/05/1999	RICHARD J. QIAN	SLA0095	2766

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EXAMINER
HANNETT, JAMES M

ART UNIT	PAPER NUMBER
2612	

DATE MAILED: 09/24/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 07-01)

	Application No.	Applicant(s)	
	09/225,189	QIAN, RICHARD J.	
Office Action Summary	Examiner	Art Unit	
	James M Hannett	2612	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☒ This action is **FINAL.**   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-10* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-10* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *31 December 2002* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

    If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:

        1.☐ Certified copies of the priority documents have been received.

        2.☐ Certified copies of the priority documents have been received in Application No. _____ .

        3.☐ Copies of the certified copies of the priority documents have been received in this National Stage
application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

    a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)	4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)	5) ☐ Notice of Informal Patent Application (PTO-152)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .	6) ☐ Other: .

DETAILED ACTION

Response to Arguments

Applicant's arguments filed 6/27/2003 have been fully considered but they are not persuasive.

As for the argument that amended Claim 1, does not use a difference image and that the original image and background image are used as inputs to the probability function. The examiner points out that it is clearly indicated in the specification on Page 5, line 15 that the equation for the probability function performs a difference calculation on the chromatic and the intensity components of the original image and the background image. Therefore, the argument that the invention does not use a difference equation and that Parulski et al in view of Brady et al does not teach the claimed invention because a difference equation is performed is not persuasive.

As for the argument that it would not have been obvious to capture first the background with no foreground, and that the background image is needed first in the invention as claimed. The examiner points out that the probability function indicated in the specification on Page 5, line 15 takes the difference of the first and second images. Therefore, both images would need to be captured before the probability function would be executed. The same is true in the difference equation of Parulski et al. Therefore the probability function can not be calculated until both images are captured. Furthermore, Parulski et al teaches the method of first capturing an image with a foreground object and a background, and second capturing an image with just a background object. It would have been obvious to one of ordinary skill in the art at the time the invention was made to capture first the background with no foreground and capturing second an

image with a background and a foreground. This is because the processing to determine the

background and foreground pictures is performed after both pictures are taken.

As for the argument that processing each R G B layer independently is not equivalent to

processing in normalized RGB space. The applicant has not given any arguments related to this

statement that changes the examiners rejection. Therefore, the rejection is upheld.

As for the argument that Parulski in view or Brady gives no indication that the output

image can be video. Parulski et al teaches on Column 5, Lines 1-20 that a sequence of first

images that include a foreground are captured which contain a moving object. Parulski et al

further teaches that only one image is captured of a background. And that a moving sequence of

images is achieved. The output image is a video image that uses the same background for several

frames. The same background image is used based on the assumption that there is no motion in

the background and that all the motion is in the foreground.

As for the argument that the use of a noise-reduction algorithm is not equivalent to a

smoothing operation. The applicant has not given any arguments related to this statement that

changes the examiners rejection. Therefore, the rejection is upheld.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3:   Claims 1, 2, 4-6,9,10 are rejected under 35 U.S.C. 103(a) as being unpatentable over

USPN 5,914,748 Parulski et al in view of USPN 5,684,898 Brady et al.

4:       As for Claim 1, Parulski et al teaches on Column 1, Lines 38-43 the use of having an

electronic imaging system take multiple images, including an image of a subject plus background

and an image of the background without a subject. Parulski et al teaches on Column 1, Lines 43-

58 how the two images can be compared and the object in the foreground can be separated from

the background; Parulski et al teaches in Figure 1 the step of separating foreground and

background images using the difference between a first and second image. Purlaski et al further

teaches in Figure 2, and on Column 3, Lines 47-64 the details of the difference calculation.

Parulski et al further discusses in Column 3, Lines 30-40 that the comparison of the two images

to classify the background image are performed on a pixel-by-pixel basis. Parulski et al teaches

on Column 3, Lines 39-45 that an additional processing or refining step is necessary to create a

suitable foreground mask image. Parulski et al depicts in Figure 1 a method of replacing an

original background image with image data from a different background. Parulski et al teaches

on Column 6, Lines 15-17 that border feathering can be utilized to better enhance border effects.

Parulski et al further teaches on Column 2, Lines 37-44 that a new composite image is formed

from the combination of the original foreground and new background image.

      Parulski et al does not specifically state that the calculation performed during image

foreground determination is performed using a probability function.

      Brady et al teaches a method for subtracting the background from an image with a

foreground and background. Brady teaches the method for characterizing the background pixels

from the foreground pixels involve the use of a probability function Column 8, Lines 14-19.

      Therefore, it would have been obvious to one of ordinary skill in the art at the time the

invention was made to include the step of classifying the foreground pixels from the background

pixels using a probability function as taught by Brady et al in the method for generating composite image of Parulski et al in order to better classify the foreground pixels from the background pixels.

Furthermore, Parulski et al teaches the method of first capturing an image with a foreground object and a background, and second capturing an image with just a background object. It would have been obvious to one of ordinary skill in the art at the time the invention was made to capture first the background with no foreground and capturing second an image with a background and a foreground. This is because the processing to determine the background and foreground pictures is performed after both pictures are taken.

5:      As for Claim 2, Parulski et al teaches on Column 3, Lines 65-67 and Column 4, Lines 1-25 that the additional processing step or refining step is performed separately for each R,G,B color layer. Parulski et al teaches that the additional processing step processes the R, G, and B difference images by separate RGB lookup tables. This is equivalent to processing in normalized RGB chromatic color space.

6:      In regards to Claims 4-6, Parulski et al teaches on Column 5, Lines 1-20 that the background replacement technique can be applied to moving subjects as well as still subjects. Parulski et al further teaches that multiple background plus subject images or just a single background plus subject image can be taken.

7:      As for Claim 9, Parulski et al teaches on Column 5, Lines 1-20 that the background replacement technique can be applied to moving subjects and that the camera can be driven to capture a motion sequence of images or video.

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8:      As for Claim 10, Parulski et al teaches on Column 3, Lines 20-22 that the new composite image is displayed on a monitor or printed using a printer. Therefore, the printed image constitutes an outputted still image.

9:      Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 5,914,748 Parulski et al in view of USPN 5,684,898 Brady et al in further view of USPN 5,382,980 Gehrmann.

Parulski et al in view of Brady et al teaches the claimed invention as discussed above in Claim 1, Parulski et al teaches on Column 3, Lines 65-67 and Column 4, Lines 1-25 that the additional processing step or refining step is performed separately for each R,G,B color layer. Parulski et al teaches that the additional processing step processes the R, G, and B difference images by separate RGB lookup tables. Parulski et al does not teach that the refinement step or additional processing step can be performed in YCbCr color space. Gehrmann teaches in the abstract a method for background replacement of an image that has a further improvement process having the background and foreground signals comprised of a red component (Cr), a blue component (Cb) and a luminance component (Y). Gehrmann teaches that this method is advantageous because an improvement of the picture quality can be achieved while using a smaller number of components. Therefore, It would have been obvious to one of ordinary skill in the art at the time the invention was made to perform the refining step as taught by Parulski et al in the YCbCr color space as taught by Gehrmann in order to achieve an improvement of the picture quality while using a smaller number of components

10:     Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 5,914,748 Parulski et al in view of USPN 5,684,898 Brady et al in further view of USPN 5,825,909 Jang.

Parulski et al in view of Brady et al teaches the claimed invention as discussed above in Claim 1, Parulski et al teaches on Column 3, Lines 43-46 that an additional refining step is used to better classify foreground pixels and background pixels. Parulski et al teaches that this process can be achieved by utilizing a noise reduction algorithm to reduce the noise in the difference image. Parulski et al does not teach that the additional processing step can use anisotropic diffusion to better classify the foreground and background pixels. Jang teaches on Column 6, Lines 47-66 that the first step for segmenting an image is the step of image smoothing. Jang further teaches on Column 7, Lines 40-47 that anisotropic diffusion filters may be used for the image-smoothing step. Therefore, It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Parulski et al to utilize the image segmentation process of Jang that includes a first step of image smoothing using an anisotropic diffusion filter for the refining step in order to better segment the foreground image from the background image.

11:   Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 5,914,748 Parulski et al in view of USPN 5,684,898 Brady et al in further view of USPN 5,710,602 Gardos et al.

Parulski et al in view of Brady et al teaches the claimed invention as discussed above in Claim 1, Parulski et al teaches on Column 3, Lines 43-46 that an additional refining step is used to better classify foreground pixels and background pixels. Parulski et al teaches that this process can be achieved by utilizing a noise reduction algorithm to reduce the noise in the difference image. Parulski et al does not teach that the additional processing step can use morphological filtering to better classify the foreground and background pixels. Gardos et al teaches on Column

8, Lines 33-37 that it is advantageous to use a morphological filter after an initial pixel-level

mask is generated in order to decrease the false foreground detections, which tend to occur along

stationary edges. Therefore, It would have been obvious to one of ordinary skill in the art at the

time the invention was made to perform morphological filtering as taught by Gardos et al in the

additional processing step of Parulski et al in order to decrease the false foreground detections

which tend to occur along stationary edges.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time

policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE

MONTHS from the mailing date of this action. In the event a first reply is filed within TWO

MONTHS of the mailing date of this final action and the advisory action is not mailed until after

the end of the THREE-MONTH shortened statutory period, then the shortened statutory period

will expire on the date the advisory action is mailed, and any extension fee pursuant to 37

CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

however, will the statutory period for reply expire later than SIX MONTHS from the mailing

date of this final action.

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to James M Hannett whose telephone number is 703-305-7880. The

examiner can normally be reached on 8:00 am to 5:00 pm M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Wendy Garber can be reached on 703-305-4929. The fax phone numbers for the

organization where this application or proceeding is assigned are 703-872-9314 for regular

communications and 703-842-9314 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding

should be directed to customer service whose telephone number is 703-308-6789.

James Hannett
Examiner
Art Unit 2612

JMH
September 10, 2003

VU LE
PRIMARY EXAMINER